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## The influence of the water matrix on the performance of sulfamethoxazole removal by catalytic wet peroxide oxidation

Rui S. Ribeiro<sup>1,\*</sup>, Zacharias Frontistis<sup>2</sup>, Dionissios Mantzavinos<sup>2</sup>,  
Adrián M. T. Silva<sup>3</sup>, Joaquim L. Faria<sup>3</sup>, Helder T. Gomes<sup>1</sup>

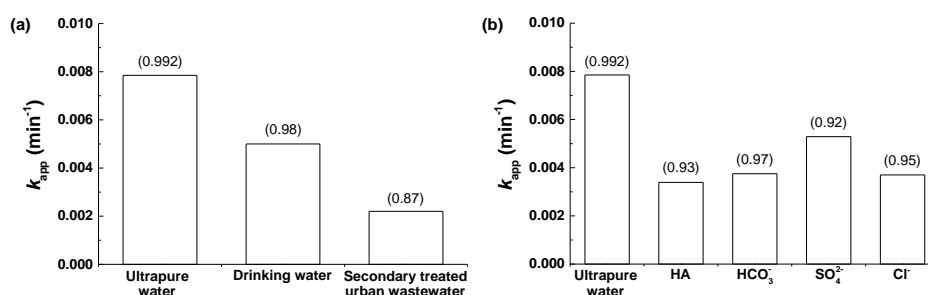
<sup>1</sup>Associate Laboratory LSRE-LCM, Instituto Politécnico de Bragança, 5300-253 Bragança, Portugal

<sup>2</sup>University of Patras, Caratheodory 1, University Campus, Patras, Greece

<sup>3</sup>Associate Laboratory LSRE-LCM, Faculdade de Engenharia, Universidade do Porto, Rua Dr. Roberto Frias, 4200-465 Porto, Portugal

\**rui.ribeiro@ipb.pt*

Laboratory grade purified ultrapure water (UP) is an attractive matrix to evaluate the performance of advanced water treatment technologies, mainly due to its easy manipulation, simplicity and reproducibility of the experimental results. However, antimicrobial agents like sulfamethoxazole (SMX) are typically found in much more complex matrices throughout the urban water cycle, such as in raw and in conventionally treated urban wastewater (UWW) [1] or drinking water (DW) [2], or in surface water and groundwater [3]. Bearing this in mind, the influence of the water matrix on the performance of SMX removal by catalytic wet peroxide oxidation (CWPO) – an advanced oxidation process typically operated at atmospheric pressure and mild temperature, was assessed in this work using secondary treated UWW and DW spiked with SMX (500 µg L<sup>-1</sup>). Synthetic water (SW) containing humic acid (HA; 40 mg L<sup>-1</sup>), bicarbonate (500 mg L<sup>-1</sup>), sulphate (60 mg L<sup>-1</sup>) and chloride (200 mg L<sup>-1</sup>), was also tested in order to mimic the presence of the typical constituents of conventionally treated UWW and DW. As observed in Fig. 1a, the performance of CWPO decreases with the increasing complexity of the water matrix. This phenomenon was ascribed to the scavenging effect promoted by the different anions considered, as well as to the negative impact of dissolved organic matter typically found in secondary treated UWW, as simulated by the presence of HA (cf. Fig. 1b).



**Fig.1.** Apparent first order reaction rate constants ( $k_{app}$ ) for SMX degradation by CWPO (6 h), when using (a) UP, DW and UWW and (b) UP and synthetic UWW, under the same operating conditions.

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